



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,624	03/31/2004	Yuji Hamada	50024-036	3821
7590 07/21/2008 MCDERMOTT, WILL & EMERY 600 13th Street, N.W. Washington, DC 20005-3096				
EXAMINER GARRETT, DAWN L				
ART UNIT		PAPER NUMBER		
1794				
MAIL DATE		DELIVERY MODE		
07/21/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/813,624

## Applicant(s)

HAMADA ET AL.

## Examiner

Dawn Garrett

## Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 19-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 19-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 16, 2008 has been entered.
2. The amendment filed May 14, 2008 has now been entered. Claim 1 was amended. Claims 4-18 are canceled. Claims 1-3 and 19-24 are pending and under consideration.
3. The rejection of claims 1-3 and 19 under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Higashi et al. (US 7,045,950) is withdrawn due to the amendment of claim 1.
4. The rejection of claims 1-3 and 19 under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Toguchi et al. (US 6,565,993) is withdrawn due to the amendment of claim 1.
5. The rejection of claims 20-24 under 35 U.S.C. 103(a) as being unpatentable over Toguchi et al. (US 6,565,993) in view of Turner et al. (US 4,764,625) is withdrawn upon further consideration.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 20 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Table 1 of the instant specification shows a value of "40 ppm" exactly, but it is not seen where there is support for "about 40 ppm". The instant disclosure does not appear to disclose or to describe "about 40 ppm" and accordingly, it is considered to be new matter in claims 20 and 21.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 20 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 20 and 21 set forth "about 40 ppm"; however, it is unclear what range of values is meant by "about". The disclosure does not provide any guidance with regard to the range intended by "about 40". Clarification and/or correction are required.

#### ***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-3 and 19-24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ishihara et al., Journal of Photopolymer Science and Technology, Vol. 15, No. 5, (2002), p. 769-774.

Ishihara teaches organic electroluminescent devices comprising a light emitting layer and hole transporting layer between an ITO anode and a MgAg cathode (see Fig. 1, page 771). Phenylamino compounds for the hole transport layer were synthesized by an Ullmann reaction in the presence of copper powder and were further purified by column chromatography and recrystallization (see section "2.1 Materials" beginning on page 770). Because Ishihara discloses the same method of making the phenylamino compounds as taught by applicant in the instant disclosure, the compounds obtained are considered to inherently have the same characteristics, including copper impurity levels, as set forth by applicant. See product-by-process discussion in MPEP 2113.

With regard to claims 19 and 24, regardless of a method of detecting impurities, the final product in the prior art is considered to meet all product limitations of the claims as required. The apparatus and method for detecting impurities do not effect the composition of the device product. In addition, ICP is a well known analytical method of elemental analysis as evidenced by Power et al. (US 5,756,786).

In the alternative that Ishihara et al. does not *anticipate* the purity levels of the organic compounds of the claims, it would have been obvious to one of ordinary skill in the art at the time of the invention to have purified and to have selected an organic phenylamino compound of a desired purity as one would expect a purer form of a compound to perform a better hole transporting function than an impure form of the compound in a device. The experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicant's claims patentable in the absence of unexpected results. Furthermore, it is obvious to purify a known compound (see MPEP 2144.04).

13. Claims 1-3 and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higashi (EP 1063869 A1) in view of Turner et al. (US 4,764,625).

Higashi et al. discloses organic electroluminescent devices with an organic compound layer having an impurity concentration of lower than 1000 ppm (see abstract). This impurity concentration encompasses the impurity range required by the present claims. The organic compounds may include phenylamino-containing compounds (see par. 49, 75-77 and 88-95). The electroluminescent devices include light emitting and carrier transporting layers per claim 3 (see par. 12). It would be obvious to one of ordinary skill in the art to use a compound at a purity level that most beneficially affects the operating performance of the device as taught by Higashi et al. to avoid degradation of the devices (see par. 6, par. 67-69). Furthermore, it is obvious to purify a known compound (see MPEP 2144.04). Higashi does not expressly teach the method of an Ullmann reaction, which involves usage of copper-containing materials, to obtain the phenylamino compounds. Secondary reference, Turner et al., teaches it is well established amino compounds may be formed by an Ullmann synthesis reaction using a copper catalyst (see

abstract). Since the method for making a tertiary amine using an Ullmann reaction is well known in the art, it would have been obvious to one of ordinary skill in the art to have selected a tertiary amine synthesized by an Ullmann reaction in the Toguchi et al. device, because one would expect the predictable result of a tertiary amine for use as a hole transporting material in an organic electroluminescent device. Compounds formed by the Ullmann process would be expected to have a similar level of copper impurities as recited in the claims, because applicant does not recite or expressly disclose any specific process of achieving the claimed levels of purity other than to synthesize the phenylamino compounds using an Ullmann reaction.

With regard to claims 19 and 24, regardless of a method of detecting impurities, the final product in the prior art is considered to meet all product limitations of the claims as required. The apparatus and method for detecting impurities do not effect the composition of the device product. In addition, ICP is a well known analytical method of elemental analysis as evidenced by Power et al. (US 5,756,786).

#### ***Response to Arguments***

14. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

With regard to the Higashi et al. U.S. patent reference previously applied, applicant argues Higashi refers only to halogen impurities. The examiner submits Higashi et al. teaches impurities in organic compound, in general, degrade organic electroluminescent device performance as is widely known in the art of organic electroluminescent devices. Although Higashi et al. does not teach an Ullmann reaction specifically for forming phenylamino compounds for the device, Higashi et al. clearly teaches phenylamino compounds for use in an

organic electroluminescent device. Secondary reference Turner et al. is incorporated to teach that an Ullmann synthesis reaction incorporating a copper catalyst is a known process for forming phenylamino compounds. Applicant has not provided evidence that the Ullmann synthesis reaction taught by Turner is different from the process used by applicant to obtain phenylamino compounds (note the discussion of product-by-process type claims discussed in MPEP 2113). Further, applicant has not disclosed a further purification step. The instant disclosure sets forth phenylamino compounds are made by an Ullmann synthesis reaction to arrive at the materials for forming the device.

Applicant alleges significantly better and unexpected results shown in instant Table 1. The examiner submits Table 1 does not show unexpected results, but rather expected results that are already known to one of ordinary skill in the art. The table shows performance improves as impurity content decrease. This is known in the art and is specifically recognized by Higashi et al. (EP 1063869 A1), which teaches purification of organic compounds to be used in an organic EL device in order to achieve the best performance. Higashi et al. '869 Table 2 on page 39 shows that the best half lifetime for a device is obtained when the most pure forms of each of the organic compounds comprising the layers of the device are used.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571) 272-1523. The examiner can normally be reached on Monday-Thursday.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on (571) 272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dawn Garrett/  
Primary Examiner, Art Unit 1794

July 18, 2008